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MACROPHYTES FROM BHOGAON RESERVOIR IN PARBHANI DISTRICT, MAHARASHTRA

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Abstract: Aquatic macrophytes include a vast majority of aquatic vascular plants. They are found mainly in the shallow water areas of ponds, lakes, rivers, swamps and streams. They are of considerable ecological and economical importance but may create saline or alkaline conditions in the soil and also give rise to many other land weeds which are dangerous for the capacity of the reservoir. The present paper describes the biodiversity of macrophytes of Bhogaon reservoir located in the Jintur tahsil of Parbhani district of Maharashtra State. The study was made during post monsoon period of October to November 2014 in which 16 species representing 16 families belonging to 4 groups such as 6 free floating weeds, 4 submerged weeds, 3 rooted emergent with heterophile weeds and 3 marginal hydrophytes.
Keywords: Aquatic macrophytes, floating, submerged, emergent, marginal weeds, Bhogaon reservoir.

Introduction

Aquatic macrophytes are defined as plants that are rooted in shallow water with vegetative parts emerging above the water surface. It is thought that emergent macrophytes are the most particularly productive of all aquatic macrophytes since they make the best use of all three possible states-with their roots in sediments beneath water and their photosynthetic parts in the air (Westlake, 1963). Macrophytic vegetation plays an important role in maintaining the ecosystem of a lake. Various types of macrophytes emergent, free floating, submerged are generally observed in an aquatic ecosystem. Free floating macrophytes leaves and roots are floating; roots are not attached in sediment. *Eicchornia crassipes* is free floating aquatic plant in which roots play important role in removing nutrients (Reed *et al., 1995*). It has tremendous capacity of absorbing nutrients and other substances from the water (Boyed, 1970) and hence brings the pollution load down. It is found to be most effective in removal of BOD, COD, nitrogen, phosphorus, organic carbon, suspended solids, phenols, pesticides, heavy metals etc from waste water (Gupta, 1982).

Macrophytes have primarily been characterized as an important food resource for aquatic organisms, providing both living (grazing food webs) and dead organic matter (detritivorous

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food webs). The macrophytes represent an important source of organic matter for aquatic herbivores and detritivores in some ecosystems (Duarte et al., 1994; Esteves, 1998; Poi de Neiff and Casco, 2003). After the systematic studies of most ecosystems by stable isotopes, which have shown that algae, both free-living and attached, are often more important than macrophytes in food webs (Araujo-Lima et al., 1986; Lopes et al., 2007).

Considering the contemplation for the significance of the macrophyte assortment the present investigation was undertaken. This aims to brief summarisation of macrophytes and their classification which will give us baseline data about species diversity in the reservoir.

Study Area

The study area Ambikapurwadi (Bhogaon) reservoir (Fig 1) is in Jintur Tahsil of Parbhani District, Maharashtra, India. Bhogaon reservoir, which is minor reservoir (with total catchment area 1.73 Sq. Km) constructed on the stream of Karpara river a tributary of Purna River. It is located in the latitude of $19^0$34′20" N, longitude of $76^0$45′30" E, included in the Survey of India toposheet no. 56 A/14 and covering reservoir area of 0.258 sq. km. The area belongs semiarid and subtropical climate with average annual rainfall of 909 mm.

Materials and Methods

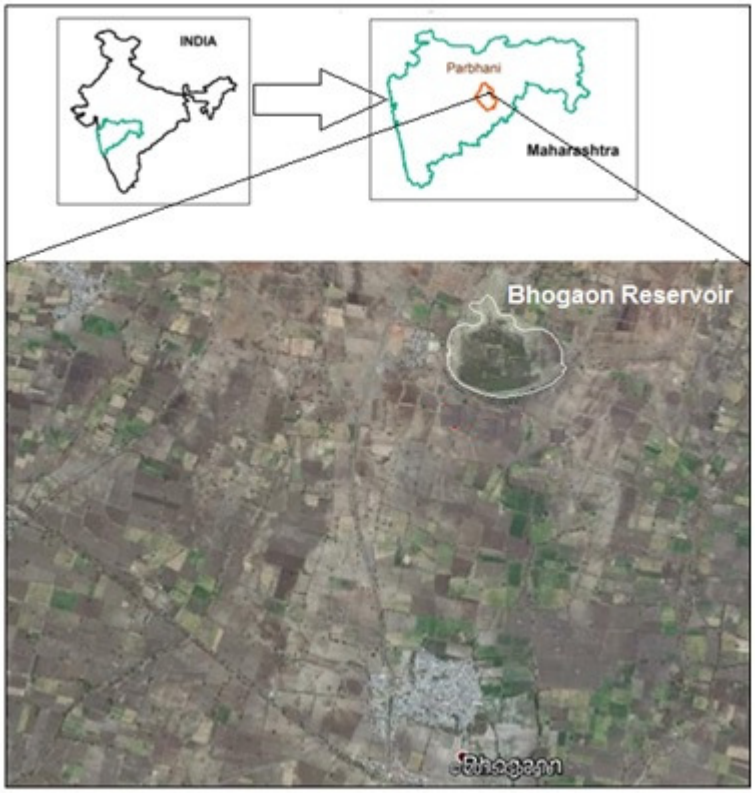

Fig. 1. Location map of Bhogaon Reservoir (Courtesy Google Image)

Macrophytes are collected through a field study of the reservoir in 2014 during which regular excursion were made to collect the information of plants of the area. Macrophytes are identified with the help of available literature of Subramanyam (1962) and Gupta (2001).

Results and Discussion

Macrophytes collected for different seasons of the reservoir included aquatic ferns and true seed producing angiosperms. A systematically classified list of 16 species of aquatic macrophytes is given in Table 1 and grouped into four categories; such as submerged weeds, emerged weeds, floating weeds and marginal weeds.

(i) Submerged Weeds

The submerged weeds under collection include Marsilea sp. Hydrilla verticellata, vallisneria spiralis, Najas sp., Cerotyphyllum sp. and Utricularia exoleta. Submerged aquatic weeds show vegetative growth during monsoon and flourished during post monsoon months. Hydrilla sp. showed profuse growth during summer. Similar observation was reported by Sharma and Singhal (1988). The growth of submerged plants during post monsoon months might have been due to high mineral concentration and better light condition (Philipose et al. 1970).

(ii) Emerged Weeds

The emerged weeds include potamegaton sp., Nymphea stellata Nelumbo mucifera, Ipomoea carnea and Trapa sp. Among these trapa sp. and potamegaton sp. were dominant in Bhogaon reservoir. Nymphea and Nelumbo sp. Show considerable growth during monsoon and post monsoon periods whereas Typha Angustata sp., Nymphaea sp., Nelumbo sp. and Trapa sp.

(iii) Floating Aquatic Weeds

The floating aquatic plants have leaves floating on water surface either singly or in groups. They have true roots, leaves and flowering parts above the water surface. Some of them are free floating while the roots of few are anchored in mud in the bottom of water body. These plants rise and fall with the level of water in the water body. The floating weeds were represented by Salvinia molesta, Eichhornia Crassipes, Lemna sp., Pistia sp., Potamegaton sp. and Nelumbo mucifera.

(iv) Marginal Weeds

The group of marginal weeds was represented mainly by Lemna sp. Ipomea sp. (Fig. 2), cyperus sp. and Marsilea sp. The marginal weeds were observed to flourish along the marginal areas of the reservoir from post monsoon. Philopse et al. (1970), Jhingran (1982),

Joshi et al. (1981) and Kadam and Babar (2012) also reported that these plants are common inhabitants of fresh water bodies of India.

During the present investigation maximum population of Hydrilla, Najas, Potamegaton and Trapa is observed. This is in accordance with the statement of Jhingran (1982), that either Hydrilla sp. alone or Hydrilla sp., and Naja sp. together dominates some water and do not normally permit the establishment of other plant except trapa sp. and water lilies.

Table 1: Macrophytic community of Bhogaon reservoir

Life form	**Name of species**	**Class**	**Family**
Floating	*Salvinia molesta*	Fern	Salviniaceae
	Eichhornia crassipes	Monocot	Pontederiaceae
	Lemna sp	Monocot	Lemnaceae
	Pistia sp.	Monocot	Araceae
	Potamegaton sp.	Monocot	Potamegatonaceae
	Nelumbo mucifera	Dicot	Nymphaceae
Submerged	*Hydrila sp.*	Fern	Hydrocharitaceae
	Naja sp.	Monocot	Najadaceae
	Ceratophylum sp.	Dicot	Ceratophyllaceae
	Utricularia exoleta	Dicot	Lentibulariaceae
Emergent	*Trapa sp.*	Dicot	Hydrocaryaceae
	Cyperus sp.	Monocot	Cyperuaceae
	Typha Angustata	Monocot	Typhaceae
Marginal	*Ipomea carnea*	Dicot	Convolvulaceae
	Cyperus sp.	Monocot	Cyperaceae
	Marsilea quadrifolia	Fern	Narasiliaceae

Aquatic weeds create situations, which are ideal for mosquito growth. The mosquitoes are sheltered and protected from their predators by aquatic weed roots and leafy growth and are responsible for the spread of Malaria, yellow fever, river blindness and encephalitis. Snails are able to multiply, playing a crucial role in the life-cycle of blood and liver flukes (parasitic worms) as they shelter, and find sustenance among the root zones. Schistosomiasis and fuscioliasis diseases spread as the floating weed carry the snails to new locations. People living close to these areas complain of mosquito problems (Kumar and Singh, 1987).

Aquatic weeds also affect quality of water. These weeds cause taste and odour problems and also increases biological oxygen demand because of organic loading. They increase the organic matter content of water that may affect the strength of the concrete structures when used as curing and mixing water (Kadam and Babar 2012). It is due to the organic matter that combines with cement to reduce bond strength and may cause large amount of air entrained in concrete.

Aquatic weeds impede the free flow of water, which may contribute to increased seepage and may cause rises in water tables in the adjoining areas. It may lead to water logging. This may also create saline conditions in the soil and also give rise to many other land weeds.

Conclusion

Aquatic macrophytes are the main primary producers of organic matter on which fishes thrive. They are also source of oxygen. They are also responding to the changes in water quality and have been used as indicator of pollution and reduction in the capacity of the reservoir. During the present study total 16 species of macrophytic community belonging to 16 different family are reported. They are broadly classified in to 4 categories including floating (6 species), submerged (4 species), emerged (3 species) and marginal (3 species) types of weeds. The measure of capacity enhancement of reservoir includes the uprooting of the weeds from dry pools of reservoirs or ponds.

Fig. 2. Photo of Ipomea Carnea, Convolvulaceae, Marginal Macrophytes

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